

RE: Test From Triumph Foods

Steve Enyart

to:

Nicole Cruise

07/28/2009 03:07 PM

Cc:

coyler, "Steve Schmidt", "Patt Lilly"

Show Details

Nicole,

Attached you will find our NOV abatement reply as well as the MSDS and instructions for the product we are hoping to use to break down the formaldehyde in the CB Formalin.

I will be out of the office the rest of the afternoon but I will call your office in the morning to discuss the use of the Formaldetox and to answer any additional questions you may have.

Thank you.

Steve Enyart

Safety Manager

senyart@triumphfoods.com

5302 Stockyards Expressway

St. Joseph, MO 64504

816-396-2825

From: Cruise.Nicole@epamail.epa.gov [mailto:Cruise.Nicole@epamail.epa.gov]

Sent: Friday, July 24, 2009 9:46 AM

To: Steve Enyart

Subject: Re: Test From Triumph Foods

Nicole Cruise

Air and Waste Management Division

RCRA Enforcement and State Programs Branch

Solid Waste Pollution Prevention Branch

U.S. EPA Region 7

913.551.7641 phone

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cruise.nicole@epa.gov

From: "Steve Enyart" <senyart@triumphfoods.com>

To: Nicole Cruise/R7/USEPA/US@EPA

Cc: "Carl Oyler" <coyler@triumphfoods.com>

Date: 07/24/2009 09:45 AM

Subject: Test From Triumph Foods

RCRA



494673

Steve Enyart
Safety Manager
senyart@triumphfoods.com
5302 Stockyards Expressway
St. Joseph, MO 64504
816-396-2825

4.0 FACILITY DESCRIPTION

4.1 Facility Information and Operations

Triumph, located in St. Joseph, MO, is a processor and exporter of premium pork products. Triumph began processing operations in January 2006 and is a producer-owned pork processing company. Triumph processes over 19,000 hogs per day and produces 40,000-45,000 boxes of pork product per day. Triumph is located on 59 acres and has over 700,000 square feet of manufacturing space and office space. Triumph has approximately 2,700 employees and operates 24 hours per day, Monday through Sunday.

Mr. Enyart stated that the hog processing operation is as follows:

1. Live hogs are brought on-site by trailer loads. The live hogs are unloaded and held in a holding area for two to four hours (de-stress period prior to anesthetization).
2. The live hogs are moved to the carbon dioxide anesthetization pit to be anesthetized (chemical stunning method). Stressed hogs are put down with .25 caliber blank rim fire cartridges (mechanical stunning method).
3. The unconscious hogs are then shackled, hoisted, and struck in the jugular veins and carotid arteries by a singular blade knife (blood is allowed to bleed out). Their heads are severed and their hair is removed (de-hairing process in 140°F water and flame singer).
4. The carcasses are then refrigerated for 24 hours.
5. After refrigeration, the carcasses are then cut into unbiased cuts (shoulders, butts, etc.).

6. Any remaining items (viscera, fat, bones, etc.) left on the carcasses are sent to the on-site Rendering Plant (production of blood meal, bone mill grease, animal feed, pet food additives, etc.).
7. The final processed cuts and Rendering Plant products are then shipped off-site to customers.

4.2 RCRA Status

Triumph has not been inspected for RCRA compliance prior to this inspection. According to the EPA RCRA Handler Report, Triumph last submitted information on May 31, 2006 as a Federal small quantity generator of D001 and D002 characteristic hazardous waste (see attachment 6 for the EPA RCRA Handler Report). I asked Mr. Enyart to review the EPA RCRA Handler Report, which I provided to him during the inspection. No changes were noted. From my review of the past three years' hazardous waste summary reports and uniform hazardous waste manifests, it appears that Triumph has never generated over 220 pounds of hazardous waste per month (see attachment 7 for the 2005-2008 Hazardous Waste Summary Report and see attachment 8 for the 2006-2009 Uniform Hazardous Waste Manifests). Based on the information obtained during the course of the inspection, I determined that Triumph is operating as a small quantity handler of universal waste, a used oil generator, and a Federal CESQG of D002, D007, D009, and D011 characteristic hazardous waste.

4.3 Waste Streams and Management

Wastewater and Sludge - Triumph discharges an average of 2,350,000 million gallons of treated wastewater per day to the City of St. Joseph, MO, wastewater collection system (see attachment 9 for the Triumph's Wastewater Contribution Permit). Triumph's wastewater consists of all associated production water used inside the entire plant (wastewater generated from the dehairing process, cutting floor, kill floor, carcass wash, equipment and building structure cleaning /rinsing, rendering cook off water, etc.). Mr. Enyart stated that Triumph's wastewater is treated on-site by an aerobic treatment system. Mr. Enyart stated that ten tanker truck loads (47,000 lbs per tanker) of wastewater sludge is generated per week and is non-hazardous based on analytical report (see attachment 10 for the Wastewater Sludge Analytical Report). From my review of the wastewater sludge analytical report, it appears that Triumph's wastewater sludge is non-hazardous. Triumph has a contract with Terra Renewal Services (TRS), Russellville, AR, to sell their wastewater sludge as fertilizer (see attachment 11 for the TRS's Missouri Fertilizer Permit). I reviewed Triumph's management of their wastewater and sludge and no apparent violations were noted.

Chemical Oxygen Demand (COD) Waste - Triumph uses COD test kits to measure the organic content of their wastewater. Triumph generates an average of 28 pounds of spent COD test solution waste per year (see photo #7). Triumph's COD test solution waste is disposed by Safety-Kleen, Kansas City, MO, as D002, D007, D009, and D011 characteristic hazardous waste. Located at the Wastewater Pretreatment Lab, I observed one 5 gallon container of COD test solution waste labeled with the words "Hazardous Waste" and dated as "March 4, 2009" (see photo #7). I reviewed Triumph's management of their COD waste and no apparent violations were noted.

Spent Rim Fire Cartridges and Spent Rubber Grommets - Triumph uses .25 caliber blank rim fire cartridges to render stressed hogs (see photos #2 and #5). The .25 caliber blank rim fire cartridges are loaded into 2ft. metal captive bolt stunners (see photos #3 and #18). Mr. Mendoza stated that rubber grommets (see photo #4) located inside the captive bolt stunners are replaced often (every shift) to ensure the stunner's effectiveness. Messrs. Mendoza and Enyart stated that Triumph's spent .25 caliber blank rim fire cartridges and spent rubber grommets are both non-hazardous (based on process knowledge) and are disposed in the general trash. Based on my review of the .25 caliber blank rim fire cartridge MSDS, it appears that the spent .25 caliber blank rim fire cartridges are non-hazardous (see attachment 12 for the .25 Caliber Blank Rim Fire Cartridge MSDS). Mr. Enyart stated that the .25 caliber blank rim fire cartridges are not slug power loads. Mr. Enyart stated that the striking of the .25 caliber cartridges causes an explosion and creates a rapidly expanding gas which drives a self retracting "bolt" into the skull of the hog. Mr. Enyart stated that no gun powder or gas penetrates the hogs. Mr. Enyart stated that Triumph uses the captive bolt stunners approximately 80 times a day and generates approximately 1,733 spent .25 caliber blank rim fire cartridges per month. At the time of the inspection, the amount of spent rubber components disposed in the general trash per year was not determined. On June 15, 2009, I spoke to Mr. Enyart (11:10 a.m. - phone conversation) and sent him an email regarding the waste generation and waste management of Triumph's spent rubber components. As of the date of this report, I have not received a response from Mr. Enyart. I reviewed Triumph's current management of their spent .25 caliber blank rim fire cartridges and spent rubber grommets and no apparent violations were noted.

Universal Waste-Lamps - Triumph generates spent fluorescent lamps (4ft. and 8ft. lamps) and spent HID lamps from their re-lamping activities. Mr. Enyart stated that Triumph's spent fluorescent lamps and spent HID lamps are recycled by Safety-Kleen, Kansas City, MO, as universal waste. Triumph generated 50 pounds of universal waste-lamps in the 2007 calendar year and 225 pounds of universal waste-lamps in the 2008 calendar year (see attachments 13 and 14 for the 2007/2008 Universal Waste Shipping Documentation). Located at the Monfort Building, I observed five closed cardboard containers of universal waste-lamps (spent 8ft. fluorescent lamps) and one yellow 55 gallon container of spent HID lamps labeled as "Waste Lamps" and "Used HID Bulbs" (see photos #14-#16). Additionally, I observed at least 37 universal waste-lamps (spent T8, 100 watt, and 8ft. fluorescent lamps) not labeled as "Universal Waste" and not stored in a closed container (see photos #10-#13). I asked Mr. Enyart if he was aware of the length of time the universal waste-lamps accumulated at the Monfort Building. Mr. Enyart stated that the universal waste-lamps located in the Monfort Building have been in storage since the last off-site shipment. At the time of the inspection, Mr. Enyart was not aware of the date of the last universal waste-lamps off-site shipment. I informed Mr. Enyart that the universal waste-lamps stored in the Monfort Building must be stored in a closed container (except for adding or removing universal waste), must be labeled with the words "Universal Waste-Lamps," "Waste Lamps," or "Used Lamps" and the earliest date of accumulation must be identified. Violations are noted in Section 5.0.

Universal Waste-Batteries - Triumph generates spent batteries (alkaline and nickel cadmium) from the battery replacement of various equipment on-site. Thus far in the 2009 calendar year, Triumph has generated 106 pounds of spent batteries (alkaline and nickel cadmium). Triumph's spent batteries are recycled by Veolia Technical Solutions, Port Washington, WI, as universal waste (see attachment 15 for the 2008-2009 Universal Waste-Batteries Shipping Documentation). Mr. Enyart stated that spent lead-acid batteries generated on-site from the service of various machinery (forklifts, shag trucks, etc.) are sent to one of three vendors for recycling (see attachment 16 for the Battery Vendor List). The quantity of spent lead-acid batteries generated per year was not determined at the time of the inspection. At the time of the inspection, I did not observe any spent lead-acid batteries in storage. Located at the PPE Room, I observed two ½ full red five gallon containers of spent alkaline batteries and spent nickel cadmium batteries labeled as "Used Batteries" (see photo #19). Located at the Parts Room, I observed one ½ full red five gallon container of spent alkaline batteries and spent nickel cadmium batteries not labeled as "Universal Waste-Batteries," "Waste Batteries," or "Used Batteries" (see photo #17). Mr. Enyart stated that the universal waste-batteries stored at the Parts and PPE Rooms have accumulated since January 2009. Triumph's latest off-site shipment of universal-waste batteries was on January 28, 2009 (see attachment 15 for the 2008-2009 Universal Waste-Batteries Shipping Documentation). I informed Mr. Enyart that the universal waste-batteries stored in the Parts Room must be labeled with the words "Universal Waste-Batteries," "Waste Batteries," or "Used Batteries." A violation is noted in Section 5.0.

Parts Cleaner - Triumph's Refrigeration Department uses Pro-Green brand cleaner to clean various equipment (mechanical seals and bearings) on-site. Mr. Enyart stated that no spent Pro-Green brand cleaner has been disposed of, as the original amount (5 gallons) put into the parts cleaner unit is still usable. From my review of the Pro-Green brand cleaner material safety data sheet (MSDS) copy, it appears that the spent cleaner would be non-hazardous (see attachment 17 for the Pro-Green Cleaner MSDS). I review Triumph's management of their Pro-Green brand cleaner and no apparent violations were noted.

Used Oil - Triumph generates an average of 1,500 gallons of used oil per year from the maintenance of their hydraulic compressor pumps. Triumph's used oil is recycled by Safety-Kleen, Kansas City, MO. Located at the East Rendering Bay and the Compressor Room, I observed one 500 gallon aboveground used oil tank and two ¾ full 55 gallon containers of used oil properly labeled with the words "Used Oil" (see photos #6 and #9). I reviewed Triumph's management of their used oil and no apparent violations were noted.

Scrap Metal - Triumph generates scrap metal from deconstruction activities conducted on-site. Mr. Enyart stated that Advantage Metal Recycling, Kansas City, MO and Midwest Scrap Management, Kansas City, MO, recycles Triumph's scrap metal. Mr. Enyart stated that Triumph recycled 79,960 pounds of scrap metal via Advantage Metal Recycling and 70,940 pounds via Midwest Scrap Management in the 2008 calendar year. I reviewed Triumph's management of their scrap metal and no apparent violations were noted.

General Trash - General trash includes empty housekeeping/cleaning containers, restroom wastes, and lunch wastes. Deffenbaugh Industries Inc., St. Joseph, MO, disposes of Triumph's general daily.

5.0 VIOLATIONS

5.0.1. Failure To Make A Hazardous Waste Determination (NOV #1)

According to 40 CFR 262.11, a hazardous waste determination must be made on all solid wastes. A hazardous waste determination had not been made on the following:

Administrative Building (Safety Office)

- One ¾ full five gallon container of formalin labeled with the words "Outdated Chemical" (see photo #1).

Mr. Enyart stated that the one ¾ full five gallon container of formalin (labeled with the words "Outdated Chemical") has been in storage at the Safety Office for at least two to three weeks. Mr. Enyart stated that the five gallon container of formalin (labeled with the words "Outdated Chemical") was determined to be unusable by the Microbiology Lab staff. I asked Mr. Enyart if the one ¾ full five gallon container of formalin (labeled with the words "Outdated Chemical") was RCRA hazardous. Mr. Enyart stated "I don't know." I asked Mr. Enyart if Triumph has made a hazardous waste determination on the one ¾ full five gallon container of formalin (labeled with the words "Outdated Chemical") in the Safety Office. Mr. Enyart stated "No."

This was a one gallon container of CB Formalin which had been brought to the Safety Manager by the Lab Manager on or about February 23rd, 2009 and informed me that they no longer had a use for it.

We did the hazard determination after the audit by calling the manufacture, Anatech LTD, who advised us that they have a process whereby the active ingredient of CB Formalin, formaldehyde, can be safely broken by our lab with another of their products, Formaldetox, and then disposed via our on site waste water pre treatment facility or a sanitary drain.

The container has been returned to storage in the Micro Lab until the Formaldetox we have ordered arrives.

NOTE: I am attaching the use instructions and MSDS for the Formaldetox to my email for your review and we will await your comments before proceeding with the disposal of the CB Formalin.

5.0.2. Failure To Store Universal Waste-Lamps In A Closed Container (NOV #2)

According to 40 CFR 273.13(d)(1), universal waste-lamps must be stored in a closed container. The following universal waste-lamps were not stored in a closed container:

Monfort Building

- One open cardboard container storing at least 20 spent T8 fluorescent lamps (see photo #10).
- One open cardboard container storing ten spent 8 ft. spent fluorescent lamps (eight green tip lamps and two silver tip spent fluorescent lamps) (see photo #11).
- One open cardboard container storing three spent T8 fluorescent lamps (see photo #11).
- One open cardboard container storing six spent 100 watt fluorescent lamps (see photo #12).

All containers which were not completely closed were sealed the day of the inspection; additional Safety Kleen boxes, designed to better accommodate our size of lamps, were ordered and put into service.



NOTE: The two boxes, against the wall, on the right are the recycle lamps.

5.0.3. Failure To Properly Label Universal Waste-Batteries And Universal Waste-Lamps (NOV #3)

According to 40 CFR 273.14, universal waste must be labeled or marked to identify the type of universal waste. Universal waste batteries must be labeled or marked as "Universal Waste-Batteries," "Waste Batteries," or "Used Batteries." Universal waste lamps must be labeled or marked as "Universal Waste-Lamps," "Waste Lamps," or "Used Lamps." The following types of universal waste (lamps and batteries) were not labeled or marked:

Parts Room

- One ½ full five gallon red container of universal waste batteries (see photo #17).

The one container of waste batteries which was missing the label was labeled the same day of the inspection.



Monfort Building

- One open cardboard container storing at least 20 spent T8 fluorescent lamps (see photo #10). This container was inadvertently left on the *Notice of Violation* form. After further review of the photograph log, this open cardboard container was properly labeled as "Waste Lamps" (see photo #13). On June 15, 2009 (11:10 a.m. - phone conversation), I informed Mr. Enyart that Triumph will not need to respond to the violation on the *Notice of Violation* form.
- One open cardboard container storing ten spent 8 ft. spent fluorescent lamps (eight green tip lamps and two silver tip spent fluorescent lamps) (see photo #11).
- One open cardboard container storing three spent T8 fluorescent lamps (see photo #11).
- One open cardboard container storing six spent 100 watt fluorescent lamps (see photo #12).
- One yellow 55 gallon container of spent HID lamps (see photo #16). This container was inadvertently left on the *Notice of Violation* form. After further review of the photograph log, the yellow 55 gallon container of spent HID lamps was labeled as "Used HID Bulbs." On June 15, 2009 (11:10 a.m. - phone conversation), I informed Mr. Enyart that Triumph will not need to respond to the violation on the *Notice of Violation* form.

All boxes containing the used lamps were labeled the next day, Safety Kleen was scheduled for a pick up, Safety Kleen boxes were acquired at the time of pick up and we now use Safety Kleen's pre printed labels for all boxes which state "NON REGULATED MATERIAL; UNIVERSAL WASTE – MERCURY CONTAINING LAMPS".



5.0.4. Failure To Demonstrate The Length Of Universal Waste Accumulation (NOV #4)

According to 40 CFR 273.15(c), a small quantity handler of universal waste must be able to demonstrate the length of universal waste accumulation. Triumph could not demonstrate the length of accumulation for the following universal waste—lamps:

Monfort Building

- One open cardboard storing containing at least 20 spent T8 fluorescent lamps (see photo #10).
- One open cardboard container storing ten spent 8 ft. spent fluorescent lamps (eight green tip lamps and two silver tip spent fluorescent lamps) (see photo #11).
- One open cardboard container storing three spent T8 fluorescent lamps (see photo #11).
- One open cardboard container storing six spent 100 watt fluorescent lamps (see photo #12).
- One 55 gallon container of spent HID lamps labeled with the words "Used HID Bulbs" (see photo #16).
- Five closed cardboard containers of universal waste—lamps (spent 8ft. fluorescent lamps) labeled as "Waste Bulbs" (see photos #14 and #15). This container was inadvertently left off the *Notice of Violation* form. On June 15, 2009 (11:10 a.m. - phone conversation), I informed Mr. Enyart that Triumph will need to respond to the violation on the *Notice of Violation* form.

I asked Mr. Enyart if he was aware of the length of time the universal waste—lamps accumulated at the Monfort Building. Mr. Enyart stated that the universal waste—lamps located in the Monfort Building have been in storage since the last off-site shipment. At the time of the inspection, Mr. Enyart was not aware of the date of the last universal waste—lamps off-site shipment date. On June 5, 2009, Mr. Enyart provided me with an electronic copy of Triumph's latest off-site universal waste—lamps shipment documentation for review (see attachment 14 for the 2008 Universal Waste Shipping Documentation). From my review of the universal waste—lamps shipment documentation, Triumph's last off-site shipment of waste—lamps was on November 6, 2008 by Safety-Kleen, Kansas City, MO.

We now use Safety Kleen's pre printed labels for all boxes which state the last date of pick up which is also the accumulation start date.



6.0. SUMMARY

At the conclusion of the inspection, I provided Triumph with a request for information (see attachment 18 for the Request for Information Correspondence) for the following: (1) a copy of the .25 caliber rim fire cartridge analytical report and MSDS, (2) a copy of the wastewater sludge analytical report copy, (3) a copy of the Pro-Green cleaner MSDS, and (4) a copy of the Hotsy Brand soap detergent MSDS (detergent used to clean the inside of the trailers that transport live hogs) (see attachment 19 for the Hotsy Brand Soap Detergent MSDS). On May 27, 2009 and June 5, 2009, I received electronic copies of all the above requested information, except for the copy of the .25 caliber rim fire cartridge analytical report (Triumph does not have any analysis of their spent .25 caliber blank rim fire cartridges). On June 15, 2009, I spoke to Mr. Enyart (11:10 a.m. - phone conversation) and sent him an email regarding the generation rate and waste management of Triumph's spent rubber components. As of the date of this report, I have not received a response from Mr. Enyart. I reviewed all applicable Federal CESQG requirements and no other apparent violations were noted in Section 5.0.



Michael J. Martin

Life Scientist

Date: June 23, 2009

Attachments

- 1) *Region 7 Multi-Media Screening Checklist* (2 pages)
- 2) *Facility Layout* (1 page)
- 3) *Confidentiality Notice* (1 page)
- 4) *Receipt of Document and Samples* (1 page)
- 5) *Notice of Violation* (2 pages)
- 6) EPA RCRA Handler Report (1 page)
- 7) 2005-2008 Hazardous Waste Summary Reports (8 pages)
- 8) 2006-2009 Uniform Hazardous Waste Manifests (14 pages)
- 9) Wastewater Contribution Permit (15 pages)
- 10) Wastewater Sludge Analytical Report (8 pages)
- 11) Missouri Fertilizer Permit (1 page)
- 12) .25 Caliber Blank Rim Fire Cartridge MSDS (5 pages)
- 13) 2007 Universal Waste Shipping Documentation (2 pages)
- 14) 2008 Universal Waste Shipping Documentation (1 page)
- 15) 2008-2009 Universal Waste-Batteries Shipping Documentation (5 pages)
- 16) Battery Vendor List (1 page)
- 17) Pro-Green Cleaner MSDS (3 pages)
- 18) Request for Information Correspondence (1 page)
- 19) Hotsy Brand Soap Detergent MSDS (2 pages)

Photograph Log (3 pages)

Photographs (11 pages/19 photos)

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: FORMALDETOX

Catalog number: 202

General use: Detoxifies formalin solutions.

Product description: White granules of sodium percarbonate.

Manufacturer

Anatech Ltd.
1020 Harts Lake Road
Battle Creek, MI 49015
USA

Emergency contact information

Health:	Anatech Ltd.	800-262-8324	8 am - 5 pm ET, M-F
Transportation:	CHEMTREC	800-424-9300	24 hours

2. COMPOSITION AND INFORMATION ON INGREDIENTS

(Note: Percentage composition is withheld as a trade secret.)

<u>Component</u>	<u>CAS #</u>	<u>Exposure limits</u>
Sodium percarbonate	156630-89-4	Not established.
Sodium carbonate	497-19-8	Not established.
Sodium metasilicate	7722-84-1	Not established.

3. HAZARDS IDENTIFICATION

Emergency overview

White granules of sodium percarbonate; a mild oxidizer.

Not likely to pose a hazard under normal conditions of use.

Potential health effects

(Human health effects only.)

Primary route(s) of exposure: Eyes.

Inhalation: Slight nose and throat irritant.

Eye: Severe eye irritant. Can cause burns to eyes.

Skin: Slight irritant.

Ingestion: Severe irritant of the mouth, throat, esophagus and stomach.

3. HAZARDS IDENTIFICATION (continued)

Chronic effects: Prolonged and repeated inhalation can cause sore throat, nose bleeds and chronic bronchitis. Repeated skin contact can cause dermatitis.

Signs and symptoms: Eyes may water and become reddened. Inhalation can cause coughing. Ingestion will result in bloating of stomach, nausea, vomiting.

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air if coughing or difficulty in breathing is experienced. Consult a physician if symptoms persist or worsen. Administer oxygen or artificial respiration as needed.

Eye: Flush eyes for at least 15 minutes in an eyewash station. If symptoms persist after washing, consult a physician.

Skin: Remove contaminated clothing, including footwear; wash before reuse or discard. For minor exposure, wash affected area with water and mild soap, rinsing thoroughly; apply a good quality skin lotion. In cases of prolonged, repeated or extensive exposure, rinse affected area or entire body for at least 15 minutes. For severe conditions, consult a physician.

Ingestion: Call a poison control center immediately. If victim is conscious, have him/her drink several glasses of water to dilute the solution. Induce vomiting only upon the advice of a physician or poison control authority.

5. FIRE FIGHTING MEASURES

Flammable properties

Flash point: Not applicable.

Flammable limit: Not applicable.

Autoignition temperature: Not applicable.

Flammability classification: Nonflammable.

Flame propagation: None.

Hazardous products of combustion: Decomposition from exposure to moisture liberates oxygen and generates heat which can support combustion. Decomposes with heat to liberate oxygen which also may cause a pressure burst if material is confined.

Extinguishing media: ABC rated portable fire extinguishers should be used. Professional fire fighters may use water spray, dry chemical or carbon dioxide.

Fire fighting instructions: Sealed chemical suits and self contained breathing apparatus are necessary for fighting fires involving substantial volumes of this product.

6. ACCIDENTAL RELEASE MEASURES

Remove dry granules. Wash affected area with water.

Comply with all applicable governmental regulations on spill reporting and on the handling and disposal of hazardous waste.

7. HANDLING AND STORAGE

Handling: No special precautions required.

Storage: Store at room temperature. Store in a dry place in original container away from excessive heat. Do not allow contamination with moisture or heavy metal salts.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Good general room ventilation is essential.

Personal protective equipment

Respiratory protection: Generally not needed, but a NIOSH-approved particle mask may be used if desired.

Skin protection: Use protective gloves when handling this powder. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

Eye protection: Use splash-proof goggles. Do not use safety glasses. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White granules.

Odor: None.

Physical state: Solid.

pH: Not applicable.

Vapor pressure: Not applicable.

Vapor density: Not applicable.

Melting point: Not applicable.

Boiling point: Not applicable.

Solubility in water: 140 g/l @ 24°C (75°F)

Specific gravity: Not applicable.

10. STABILITY AND REACTIVITY

Chemical stability: Slow release of oxygen is normal.

Conditions to avoid: Heat and moisture.

Incompatibility with other materials: Water, acids, bases, salts of heavy metals, reducing agents, organic materials and flammable substances.

Hazardous decomposition products: Oxygen; decomposition releases steam and heat.

Hazardous polymerization: None.

11. TOXICOLOGICAL INFORMATION

Acute eye effects: The material produced severe damage when administered to rabbit eyes.

Acute skin effects: The material produced slight irritation when applied to rabbit skin. No sensitization was noted when administered as a 75% w/v mixture during induction and as a 25% w/v mixture at challenge.

Acute oral effects: OSHA considers chemicals to be toxic if their LD₅₀ is at or below 500 mg/kg. LD₅₀ is the dose killing 50% of the test animals in a given time (usually 4 hours). LD₅₀ was 14,034 mg/kg in rats.

Acute inhalation effects: OSHA considers chemicals to be toxic if their LC₅₀ is at or below 20 mg/kg. LC₅₀ is the airborne concentration killing 50% of the test animals. LC₅₀ was > 4,580 mg/m³ in rats.

Chronic effects/carcinogenicity: None known.

Teratology: None known.

Reproductive effects: None known.

Mutagenicity: None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish

Pimephales promelas: LC₅₀: 70.7 mg/l

Pimephales promelas: 96 hr NOEC: 1 mg/l

Crustaceans

Daphnia pulex: EC₅₀: 4.9 mg/l

Daphnia pulex: 48 hr NOEC: 1 mg/l

Environmental fate: Toxic for aquatic organisms. The hazard for the environment is limited because it does not bioaccumulate, and it degrades abiotically into products of low toxicity.

13. DISPOSAL CONSIDERATIONS

Dissolve in water and pour down the drain. Aqueous solutions are not hazardous.

14. TRANSPORTATION INFORMATION

Packaging for hazardous shipments must meet the specifications as required by the current editions of *International Air Transportation Association (IATA) Dangerous Goods Regulations* and the United States Department of Transportation 49 CFR.

DOT (ground and air) and IATA: Proper Shipping Name: Sodium carbonate peroxyhydrate
UN #: 3378
Hazard Class: 5.1
Packing Group: II

15. REGULATORY INFORMATION

OSHA (USA): Under the Hazard Communication Standard and the Laboratory Standard, this product is a hazardous material: it is an eye irritant. The OSHA Standards cited mandate that exposed workers receive proper training in the properties of this product, work practices involved with its handling and disposal, and interpretation of its MSDS.

FDA (USA): Not applicable.

EPA (USA): Formaldetox is a reportable substance under SARA Title III.

16. OTHER INFORMATION

Label warnings: Severe eye irritant. Keep off mucous membranes.

NFPA (National Fire Protection Association) Rating:

General note: This rating is applicable only to safeguard the lives of individuals who may be concerned with fires occurring in an industrial plant or storage location. The ratings provide information to emergency personnel on whether to evacuate the area or how to perform control procedures. It is not descriptive of hazards under normal conditions of occupational use, and is even less applicable to anticipated laboratory-scale use.

Health 2: Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Flammability 0: Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

Instability 1: Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures.

Special: OX

This Material Safety Data Sheet has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard. It conforms to the provisions of the American National Standards Institute (ANSI) Standard Z400.1 (Standard for the Preparation of Material Safety Data Sheets). Information contained herein was obtained from sources which Anatech Ltd. believes are reliable. It is the user's responsibility to determine suitability of the product for his/her own use, and to assure proper use and disposal of it to protect the safety and health of employees and the protection of the environment.

PRODUCT INFORMATION

FORMALDETOX

INTENDED USE

FORMALDETOX is intended to be used to destroy the hazardous component of histological solutions of 10% formalin (3.7% formaldehyde) so that the resulting mixture can be discarded into a sanitary sewer system. Users should obtain approval from local wastewater (sewage) treatment plants before disposing of detoxified formalin in this manner. FORMALDETOX can be used on unbuffered formalin, neutral buffered formalin, unbuffered zinc formalin and buffered zinc formalin (ANATECH's Z-FIX). See special instructions below for zinc-containing solutions. FORMALDETOX will also detoxify the residue remaining after distillation of any of these formalin solutions in B/R Instrument's PureForm 2000™ Formalin Recycling System. Do not use FORMALDETOX with alcoholic formalin. Other formulations may or may not be suitable for detoxification (see below).

MECHANISM OF ACTION

FORMALDETOX oxidizes formaldehyde to formic acid and immediately neutralizes it to sodium formate. Byproducts of the reaction are sodium carbonate, sodium bicarbonate, carbon dioxide and water. Methanol (present as a stabilizer in most formalin solutions) is also oxidized to sodium formate. Phosphate buffer salts will remain unchanged. The pH of the detoxified solution will range from 7.5-9.2, and will not need neutralization prior to drain disposal.

Zinc compounds may interact with FORMALDETOX, making it less efficient, and should be removed prior to detoxification. The extent of interaction varies with the type of zinc salt used in the formulation. If left in the solution, zinc will be precipitated as oxides, hydroxides and carbonates.

Warm water is added to the waste formalin in a 1:1 ratio to control the rate of reaction. The reaction is exothermic (produces heat), so the solution will warm to 55-70° C, depending upon the starting temperature. The final level of destruction is dependent upon temperature, so warm (but not hot) water is recommended.

FORMALDETOX is effervescent and requires no mixing when in solution.

OBTAINING LOCAL APPROVAL

The US EPA allows onsite treatment of hazardous waste using pH neutralization, precipitation and oxidation/reduction reactions¹. Formaldetox uses an oxidation/reduction reaction. Removing zinc from solution is a precipitation reaction. Therefore, Formaldetox can be used as directed according to the EPA. That said, there are a few states that narrow the scope of disposal options. Alabama, Massachusetts and Rhode Island prohibit onsite treatment. Several others place quantity and/or reporting restrictions on onsite treatment: Arkansas, Colorado, Maine, Maryland, New Hampshire and New Mexico. Your wastewater treatment authority should be able to advise you of your state's regulations.

While the detoxified solution is nonhazardous by most criteria, it is prudent to check with your local wastewater treatment plant (POTW, or publicly owned treatment works) before using FORMALDETOX. Contact the Plant Manager and inform him/her of what you wish to do. State that 3 gallons of pretreated formaldehyde waste will be discarded at a time, and that this will occur periodically (tell how many times per week or month). Provide the manager with copies of the analysis (see below) and the MSDS for the detoxified solution. Inquire if the solution can be poured down the drain at one time or if it should be trickled into the system over a period of an hour or more.

Some POTW's will accept 3.7% formaldehyde in small quantities. Others will not accept solutions exceeding 0.1 ppm (0.1 mg/l, or 0.00001%) formaldehyde. FORMALDETOX will produce a solution containing less than 100 ppm (mg/l), providing there is no zinc present. If detoxification produces a solution that is still above allowable limits set

¹ US Environmental Protection Agency, 2000. *Environmental Management Guide for Small Laboratories*. EPA 233-B-00-001

by your POTW, consider trickling the solution into the drain over a period of time. You are not allowed to add more water to the waste for the purpose of diluting it below acceptable limits; however, you can take advantage of the normal flow of wastewater through your facility's drain pipes.

As an example of this, assume that your detoxified solution contains 100 ppm (mg/l) formaldehyde, that your POTW sets a limit of 1 ppm (mg/l) formaldehyde, and that your facility discharges 200 gallons of wastewater to the sewer each hour. By trickling the detoxified formalin solution into the drain for an hour, you will passively dilute it 200 fold, and the wastewater entering the public sewer system will contain 0.5 ppm (mg/l). This is one half of the acceptable limit, and should be permissible. Your POTW will probably know your daily discharge rate unless your facility is very small.

If you need to trickle the solution into the drain, obtain a spigot (ANATECH Cat.# 001) for the REACTION DRUM. Adjust this spigot so that it drips at a suitable rate. This spigot must not be on the REACTION DRUM during the detoxification process, as it will block the release of gases.

ANALYSIS OF DETOXIFIED SOLUTIONS

Typical analysis of a detoxified solution of zinc-free, 8-10% formalin yields the following:

sodium formate.....	< 4.2 %	sodium carbonate & bicarbonate	7.9 %
formaldehyde.....	< 100.0 ppm (mg/l)	sodium sulfate	< 0.7 %
methanol.....	< 0.65 %	pH.....	7.5-9.2

For phosphate-buffered neutral formalin, there will also be:

sodium phosphate, monobasic and dibasic..... 6.2 %

DIRECTIONS FOR USE

Optimal results can only be obtained when detoxification is performed according to these simple directions. To guarantee safety and efficacy, the reaction must be carried out in the special REACTION DRUM (Cat. # 203).

General instructions

1. Wear safety goggles (not glasses), gloves and an impervious apron, as mandated by OSHA in the Formaldehyde Standard. This is for protection against formaldehyde.
2. Remove zinc if present. If the solution does not contain zinc, proceed to Step 3.
 - a. Dissolve 25 g monobasic sodium phosphate, monohydrate in 500 ml warm, deionized or distilled water.
Note #1: Do not use dibasic or tribasic sodium phosphate because the precipitate will be difficult to filter.
Note #2: This amount of monobasic sodium phosphate is suitable for ANATECH's zinc products; other brands may require additional phosphate. Call us for assistance in determining the correct amount to use.
 - b. Add the phosphate solution to 1.5 gallons of waste formalin that contains zinc.
 - c. Allow the mixture to react for an hour.
 - d. Filter the solution through a conical coffee filter paper into the REACTION DRUM. We recommend a #6 filter for Melita coffee makers in an 8 inch diameter plastic funnel. Laboratory filter paper (Whatman) is too slow. Perform the filtering operation in a well ventilated area, preferably under a fume hood. You may filter the solution directly into the REACTION DRUM.
 - e. Rinse the precipitate with a small amount of tap water to wash the formaldehyde from the filter.
 - f. Discard the filter paper with precipitate in the general trash. The precipitate consists of oxides, hydroxides and phosphates of zinc, all of which generally are considered nonhazardous for this means of disposal.
 - g. Proceed to Step 4 with zinc-free waste formalin in the REACTION DRUM.

3. Fill the REACTION DRUM to the lower (1.5 gallon) mark with waste formalin (if not already present from Step 2. Note Special Instructions below).
4. Fill to the upper (3.0 gallon) mark with lukewarm (20-30° C) tap water (or add 1.5 gallons of lukewarm water). Do not use cold (< 20° C) water (the reaction will be incomplete) or hot (> 30° C) water (the reaction will proceed too fast and the solution will get too hot).
5. Add two containers of FORMALDETOX. Do not stir or shake the mixture; the granules will dissolve slowly with effervescence.
6. Cap the REACTION DRUM with the vapor scrubber, or place the uncapped drum inside a fume hood. Do not use the spigot or any other cap to close the opening in the drum.
7. Allow the reaction to proceed for 8 hours or longer (overnight is usually convenient).
8. Discard the solution down the drain if given approval by appropriate officials. If the solution must be trickled into the drain, replace the vapor scrubber with a self-venting spigot (ANATECH Cat. # 001). The copious, white, fluffy precipitate is undissolved sodium carbonate and may be poured down the drain without filtering.

Special Instructions

Most waste formalin is not rich enough in dissolved solids to cause problems when used as directed above. However, waste formalin that has had a large amount of tissue stored in it for prolonged periods is likely to foam excessively. Macromolecules trap the tiny bubbles of carbon dioxide that are generated during the reaction, producing foam that is sometimes too copious to be contained by the drum. The solution has not boiled over (the temperature is not that high), it has simply foamed over. If this occurs, replace the charcoal in the vapor scrubber. In particular, beware of waste formalin that has been used to fix placentas and other very bloody specimens. Still bottoms from formalin recycling stills will also be rich in dissolved macromolecules. In these cases, follow these special directions:

1. Add 0.75 gallons of waste formalin to the reaction drum.
2. Add water (20-30° C) to the 3.0 gallon mark.
3. Add one tube of FORMALDETOX to the solution.
4. Allow the reaction to proceed as usual.

Warnings

1. Wear splashproof safety goggles (not glasses), gloves and impervious apron when removing zinc and when filling the REACTION DRUM to protect against formaldehyde. Goggles are recommended when discarding the detoxified solution to avoid possible eye injury (sodium carbonate is an eye irritant). Wear an apron at this time as well to keep from getting sodium carbonate on your clothes; it will not harm them but will create white spots after it dries. If that occurs, remove the spots with warm water.
2. The directions are designed to create a carefully controlled reaction. Failure to heed these warnings constitutes misuse of the product.
 - a. DO NOT detoxify waste containing more than 10% formalin (3.7% formaldehyde).
 - b. DO NOT detoxify more than 1.5 gallons of waste at a time.
 - c. DO NOT use hot water.
 - d. DO NOT mix or shake the solution.
 - e. DO NOT use more than two containers of FORMALDETOX at a time.

Note #3: All of these actions will increase the rate of heat production and could cause the solution to boil. While the REACTION DRUM will contain 3 gallons of solution if it boils, the heat could cause thermal burns to anyone touching the drum. If more than 3 gallons of solution boils, it could spill out the vapor scrubber and/or vent.

3. DO NOT cap the drum with a conventional sealed cap; always use the vapor scrubber (or leave the drum uncapped if conducting the reaction in a fume hood). Gases (mostly carbon dioxide) are given off during the reaction, and must be allowed to escape. The small colored plug in the top of the drum is a safety device designed to pop out if too much pressure builds up because of misuse of the cap.
4. DO NOT use FORMALDETOX as a detoxification agent for any chemical other than formaldehyde.

Additional information on formalin solutions containing zinc

ANATECH's zinc products contain 600 ppm (mg/l) of zinc-ions. If zinc is allowed to remain in the waste during detoxification, the final concentration will be less than 300 ppm (mg/l) zinc. Your local POTW may or may not allow that much zinc to be introduced into the sewer system. If it is allowed, you may still wish to remove it prior to detoxification because of the inhibiting effect zinc salts have on the detoxification reaction. Different zinc formulations influence the reaction in various ways. Our products produce the following effects:

<u>Zinc fixative</u>	<u>Formaldehyde content after detoxification</u>	
	<u>Zinc not removed</u>	<u>Zinc removed</u>
ZINC FORMALIN	<100 ppm	<100 ppm
Z-FIX	250-500 ppm	<100 ppm

Other formulations may affect the reaction differently. If you wish to use FORMALDETOX on them without removing the zinc, please give us a call. We will test the solution before detoxification and will then advise you on the proper course of action.

Special directions for detoxifying stillbottoms from formalin recycling operations

The residue (stillbottoms) left after distillation of waste formalin in B/R Instrument's PureForm 2000™ Formalin Recycling System can be detoxified in the same manner as regular formalin. Simply follow the standard directions.

CARE OF THE VAPOR SCRUBBER

The scrubber contains a column of activated charcoal which should function satisfactorily for a number of reactions. When formaldehyde odors become noticeable, replace the charcoal. Carefully unscrew the cylindrical portion of the scrubber and discard the charcoal. Replace it with 8-20 mesh activated charcoal, such as Sigma Cat.# C2889. When reassembling the unit, place rubber gasket on the upper piece and screw the top of the scrubber into place. Place the used charcoal in a plastic bag and discard it in an appropriate manner.

STORAGE, HANDLING AND DISPOSAL OF UNUSED FORMALDETOX

Store at room temperature. Keep dry. If FORMALDETOX becomes wet, or if you wish to dispose of it, dissolve it in tap water and pour the solution down the drain after 24 hours. At that point it will contain only sodium carbonate, sodium bicarbonate and sodium sulfate. Spills should be treated in the same manner. The white residue left when splashes dry is sodium carbonate, sodium bicarbonate and sodium sulfate, and is harmless.

Effective: January 2006